

Atomic and Ionic Radii

1) Justify why a chloride ion, Cl^- , is larger than a chlorine atom, Cl , whereas a sodium ion, Na^+ , is smaller than a sodium atom, Na .

2) Match the atoms and ions in the table below to the given radii **Radii:** 77 pm 123 pm 128 pm Justify your answer.

Symbol	Radii
Ge	
Cu	
Cu^+	

3) State which has the larger radius, Al or Al^{3+} . Justify your answer.

4) Match the atoms and ions in the table below to the radii given. **Radii** 99 pm 137 pm 197 pm Justify your answer.

Ca	Ca^{2+}	Mn

5) Account for the difference in atomic or ionic properties given in the table below

Atom/ion	Radius (pm)
Br	114
Br ⁻	196
I	133

6) Place the following species in order of increasing size: H, H⁺, H⁻. Justify

7) A bromine atom, Br, has more electrons than a scandium atom, Sc, but its radius is smaller. Explain.

8) Explain the difference between the radii of the following species.

i) K atom and K⁺ ion

ii) P atom and P³⁻ ion

9) Compare the relative sizes of the Ca²⁺ and Cl⁻ ions, and explain the difference in their radii.